GBIC Transceiver Installation Guide

3Com Gigabit Interface Converter (GBIC) Transceivers

3com

2

Introduction

The Gigabit Interface Converter (GBIC) ports on your system connect to Gigabit Ethernet networks through a GBIC transceiver (Figure 1), providing a high-speed connection over fiber-optic or copper cable. The transceiver connects to the network using a fiber-optic duplex subscriber connector (SC) or a RJ-45 connector. You can remove and replace the transceiver with the system on (which is called *hot-swapping*).

Figure 1   GBIC Fiber-Optic Transceiver
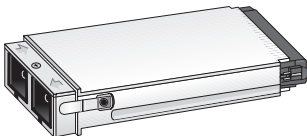
This Guide describes how to install the following GBIC transceivers:

- 1000BASE-SX GBIC (3CGBIC91)
- 1000BASE-LX GBIC (3CGBIC92)
- 1000BASE-T GBIC (3CGBIC93)
- 1000BASE-LH70 GBIC (3CGBIC97)

To ensure optimal performance, compatibility, and regulatory compliance, use only GBIC transceivers that 3Com supports. For a list of currently supported GBICs, see this 3Com Web site:

http://www.3com.com/products/

At this web site, you can also find the most up-to-date information, User Guides and Release Notes about this and other 3Com products.

1000BASE-SX GBIC Transceivers

The 1000BASE-SX GBIC transceiver supports a direct connection to 62.5-micron or 50-micron multimode fiber-optic cable. Table 1 shows the ranges for each connection.

Table 1   1000BASE-SX GBIC Multimode Transmission Ranges

Fiber Type	Diameter (microns)	Modal Bandwidth (MHz • km)	Transmission Range in meters (feet)
Multimode	62.5	160	2 – 220 (6.6 – 721.8)
Multimode	62.5	200	2 – 275 (6.6 – 902.3)
Multimode	50	400	2 – 500 (6.6 – 1640.5)
Multimode	50	500	2 – 550 (6.6 – 1804.6)

1000BASE-LX GBIC Transceivers

1000BASE-LX GBIC transceiver supports these connections:

- Direct connection to single-mode fiber-optic cable.
- Connection to multimode fiber through a conditioned launch cable

> **i** *To ensure optimal performance, compatibility, and regulatory compliance, use only conditioned launch cables that 3Com supports. For a list of currently supported conditioned launch cables, see this 3Com Web site:*

http://www.3Com.com/gigabit_ethernet/gbics

Table 2 shows the transmission ranges for each connection

Table 2 1000BASE-LX GBIC Multimode and Single-Mode Transmission Ranges

Fiber Type	Diameter (microns)	Modal Bandwidth (MHz • km)	Transmission Range in meters (feet)
Multimode	62.5	500	2 – 550 (6.6 – 1804.6)
Multimode	50	400	2 – 550 (6.6 – 1804.6)
Multimode	50	500	2 – 550 (6.6 – 1804.6)
Single-Mode	9	–	2 – 10,000 (6.6 – 32,810)

1000BASE-LH70 GBIC Transceivers

Table 3 shows the transmission range and other data for this connection.

Table 3 1000BASE-LH70 GBIC Single-Mode Transmission Range

Fiber Type	Diameter (microns)	Minimum Connector End Polish	Transmission Range
Single-mode	9μm core	PC	20 – 70 km (13 – 43 miles)

Table 4 shows the optical parameters of the 1000BASE-LH70 GBIC Transceiver.

⚠ **CAUTION:** *If using cable lengths shorter than 20 km, you must ensure that a single-mode fiber attenuator is used to avoid signal saturation.*

Table 4 Optical Parameters

	Parameter	Symbol	Min	Typ	Max	Units
Transmitter	Wavelength	λ_c	1540	1550	1570	nm
	Optical output power	P_{out}	0	N/A	+4	dBm
	Note: Average power coupled into single-mode fiber					
Receiver	Optical input power	P_{in}	−24	N/A	-1	dBm
	Note: BER< 10^{-12} with PRBS $2^7 - 1$ test data pattern @ 1.25Gb/s					

1000BASE-T GBIC Transceivers

The 1000BASE-T GBIC transceiver supports connections over Category 5 cabling up to 100 m (328 ft).

Installing the Transceiver

The following instructions, warnings and notes apply to all of the transceivers covered in this Guide.

Safety Precautions

Be sure to follow all safety precautions when you replace a GBIC transceiver in the system. To avoid electric shocks and burns to yourself and damage to the equipment, read and follow these warnings:

WARNING: When the system is on:

- *Never insert a metal object such as a screwdriver or a finger with jewelry into open module slots.*
- *Do not touch any connections inside the chassis with your hands or fingers.*

AVERTISSEMENT: Quand le systeme est allumé:

- *Ne jamais introdure d'objet métallique, tel qu' un tourne vis ou meme votre doight si vous portez un bijou dans le reserve au module.*
- *Ne touchez aucun engrenage à l' interieur du chasis avec le doight ou la main.*

VORSICHT: Wenn das Betriebssystem angeschaltet ist:

- *Führen Sie niemals einen Metallgegenstand wie z.B. einen Schraubenzieher oder einen beringten Finger in den offenen Modulschlitz ein.*
- *Berühren Sie keine Verbindungen innerhalb des Gehäuses mit Ihren Händen oder Fingern.*

Fiber Safety Precautions

The GBIC fiber ports on your system use lasers. To ensure your safety when you install or work with these GBIC systems, read and comply with the precautions in this section.

WARNING: The fiber optic lasers used in 3Com GBIC ports meet the regulatory requirements for casual exposure to the eye. As with any source of bright light, however, 3Com recommends that you do not look into the laser light source.

IEC 825, Class 1 Laser Devices are for connection only to Class 1 Laser Devices. Multimode and single-mode fiber optic interfaces use lasers.

```
CLASS 1
LASER PRODUCT
```

Inserting the Transceiver

Before you connect the system to the Gigabit Ethernet network, first insert the transceiver into the GBIC port on the system, as described in this section. The procedure is similar for all supported units with a GBIC port.

> *To ensure optimal performance, compatibility, and regulatory compliance, use only GBIC transceivers that 3Com supports. For a list of GBIC devices that are qualified for the 3Com products see this 3Com Web site:*

http://www.3com.com/gigabit_ethernet/gbics

> **CAUTION:** *GBIC transceivers are keyed and can be properly inserted only one way. If the transceiver does not click when you insert it, remove it, turn it over, and reinsert it.*

1 Read and follow the instructions in "Safety Precautions" earlier in this guide.

2 Orient the transceiver so that the duplex SC or RJ-45 connector is toward you.

   Figure 2 shows how to insert the transceiver into a GBIC port. Installation into other chassis is the same except that the chassis ports may be oriented vertically.

3 Gently slide the transceiver into the GBIC port until it clicks into place.

Removing the Transceiver

To replace an existing GBIC transceiver, compress the side tabs and gently pull the transceiver out of the port.

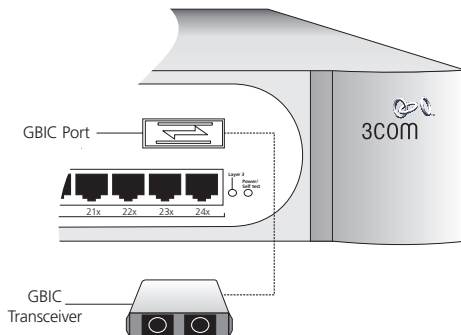**Figure 2** Inserting the GBIC Transceiver in a GBIC Port

Figure 2 *shows a switch in the SuperStack 3 Switch 4900 Series. Your unit may have its GBIC port located in a different position, but the install procedure is the same.*

Troubleshooting Transceivers

After you insert the GBIC transceiver into the port, the system software verifies the transceiver operation. If you should experience problems refer to the steps and conditions below.

> *To ensure optimal performance, compatibility, and regulatory compliance, use only GBIC transceivers that 3Com supports. For a list of currently supported GBICs, see this 3Com Web site:*

http://www.3com.com/gigabit_ethernet/gbics

No LED Error

If the GBIC LED does not light after you insert it into the chassis, remove the GBIC and re-insert it.

If the transceiver is not working properly, the system displays an appropriate error message, as described in the following sections.

> *All these error messages apply to the Switch 4007 only.*

"Unqualified GBIC" Error

If the system detects an unqualified GBIC or a problem with the integrity of the GBIC, it sets the port type to *Unqualified GBIC*, displays a short description (Uqual.GBIC), and captures the error in the event log.

> *Using a newer version GBIC transceiver (GBIC91, GBIC92, GBIC93, or GBIC97) in a system running older code (pre-Release 3.0) can generate the following message.*

```
WARNING:
The GBIC in Port xx is NOT approved by 3Com & may
violate electromagnetic emission or safety
requirements for your country. Refer to 3Com's web
page (www.3com.com/gigabit_ethernet/gbics) for our
current approved list.
```

For a list of GBIC devices that are qualified for the Switch 4007, see the 3Com Web site at **http://www.3com.com/gigabit_ethernet/ gbics.**

The event log may show one of the following informational messages:

- Unqualified GBIC: I2C read error

  Meaning: The transceiver, which connects to the module host board through a 20-pin connector is not seated properly, and a clean connection cannot be established.

  Corrective action: Completely remove the transceiver and then reinsert it. If the problem persists, contact 3Com Technical Support. For contact information in the United States and Canada, call 1-800-NET-3COM. For the number to call in other locations, visit the 3Com Web site: **http://www.3com.com/util/ enterprise.html**.

■ Unqualified GBIC: Checksum match error

Meaning: The system uses checksum error detection to verify the integrity of the GBIC data. If the system detects a problem with the data, it displays an error message that indicates a checksum failure.

Corrective action: Although this condition does not necessarily indicate that the GBIC transceiver will not function in the system, replace the transceiver to ensure proper operation.

■ Unqualified GBIC: MODDEF Value – xx

■ Unqualified GBIC: Transceiver byte(s) error

Meaning: For both of these messages, the value (xx) of this GBIC type is not a Module Definition 4 GBIC (Serial Identification) as defined by the Gigabit Interface Converter specification.

Corrective action: Replace this transceiver with a GBIC that is qualified by 3Com.

GBIC Disable Error

If the system detects that the transceiver cannot emit the proper laser signal, it disables the port, sets the port type to disabled, displays a short description (GBIC Disable), and captures the error in the event log.

The following message appears in the event log:

```
Due to excessive TxFault conditions, GBIC Port xx has
been disabled.
```
Meaning: Excessive Tx Fault conditions indicate a faulty GBIC.

Corrective action: Replace the transceiver. If the problem persists, contact network supplier or 3Com Technical Support. For contact information, see the Technical Support appendix in the Getting Started Guide for your system.

"Unapproved GBIC" Error

Supported transceivers are those that 3Com has specifically tested and qualified for use with 3Com GBIC systems. Pretesting at 3Com ensures proper functionality, compatibility, and regulatory compliance with the system.

If the system detects a transceiver that 3Com does not support, it sets the port type to *Unqualified GBIC*, displays a short description, (Unappr.GBIC), and captures the error in the event log.

```
WARNING
The GBIC in Port xx is NOT approved by 3Com & may
violate electromagnetic emission or safety
requirements for your country. Refer to 3Com's web
page (www.3com.com/gigabit_ethernet/gbics) for our
current approved list.
```

The following informational message is shown in the event log:

■ Unqualified GBIC: Unqualified vendor part number

Corrective action: Although this report does not necessarily indicate that the GBIC transceiver will not function properly with the system, it does indicate that 3Com has not qualified the transceiver and does not support it.

Safety Information

You must read the following safety information before carrying out any installation or removal of components, or any maintenance procedures on the Switch.

WARNING: Warnings contain directions that you must follow for your personal safety. Follow all directions carefully.
You must read the following safety information carefully before you install or remove the unit.

AVERTISSEMENT: Les avertissements présentent des consignes que vous devez respecter pour garantir votre sécurité personnelle. Vous devez respecter attentivement toutes les consignes.
Nous vous demandons de lire attentivement les consignes suivantes de sécurité avant d'installer ou de retirer l'appareil.

VORSICHT: Vorsicht enthalten Anweisungen, die Sie zu Ihrer eigenen Sicherheit befolgen müssen. Alle Anweisungen sind sorgfältig zu befolgen.
Sie müssen die folgenden Sicherheitsinformationen' sorgfältig durchlesen, bevor Sie das Gerät installieren oder ausbauen.

WARNING: Fiber Optic ports - Optical Safety

```
┌─────────────────────────────┐
│   ┌─────────────────────┐   │
│   │      CLASS I        │   │
│   │   LASER DEVICE      │   │
│   └─────────────────────┘   │
└─────────────────────────────┘
```

Never look at the transmit laser while it is powered-up. Never look directly at the fiber ports and fiber cable ends when they are powered-up.

WARNING: *Use of controls or adjustments of performance or procedures other than those specified herein may result in hazardous laser emissions.*

AVERTISSEMENT: Ports pour fibres optiques – sécurité sur le plan optique

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┌─────────────────────────────┐
│   ┌─────────────────────┐   │
│   │   DISPOSITIF LASER   │   │
│   │    DE CLASSE I       │   │
│   └─────────────────────┘   │
└─────────────────────────────┘
```

Ne regardez jamais le laser tant qu'il est sous tension. Ne regardez jamais directement le port à fibres optiques et les embouts de câbles à fibres optiques tant qu'ils sont sous tension.

AVERTISSEMENT: L'utilisation de contrôles, de réglages de performances ou de procédures autres que ceux qui sont spécifiés au sein du présent document risquent d'entraîner l'exposition à des rayonnements laser dangereux.

VORSICHT: Faseroptikanschlüsse – Optische Sicherheit

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LASERGERÄT
DER KLASSE I
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Niemals ein Übertragungslaser betrachten, während dieses eingeschaltet ist. Niemals direkt auf die Faseransnchlüsse und auf die Faserkabelenden schauen, während diese eingeschaltet sind.

VORSICHT: Die Verwendung von Steuerelementen oder die Anpassung von Leistungen und Verfahren in anderer als der hierin genannten Weise kann zu gefährlichen Laseremissionen führen.

Technical Support

3Com provides easy access to technical support information through a variety of services. This appendix describes these services.

Information contained in this appendix is correct at time of publication. For the most recent information, 3Com recommends that you access the 3Com Corporation World Wide Web site.

Online Technical Services

3Com offers worldwide product support 24 hours a day, 7 days a week, through the following online systems:

- World Wide Web site
- 3Com Knowledgebase Web Services
- 3Com FTP site

World Wide Web Site

To access the latest networking information on the 3Com Corporation World Wide Web site enter this URL into your Internet browser:

http://www.3com.com/

This service provides access to online support information such as technical documentation and software library, as well as support options that range from technical education to maintenance and professional services.

3Com Knowledgebase Web Services

The 3Com Knowledgebase is a database of technical information to help you install, upgrade, configure, or support 3Com products. The Knowledgebase is updated daily with technical information discovered by 3Com technical support engineers. This complimentary service, which is available 24 hours a day, 7 days a week to 3Com customers and partners, is located on the 3Com Corporation World Wide Web site at:

http://knowledgebase.3com.com

3Com FTP Site

Download drivers, patches, software, and MIBs across the Internet from the 3Com public FTP site. This service is available 24 hours a day, 7 days a week.

To connect to the 3Com FTP site, enter the following information into your FTP client:

- Hostname: **ftp.3com.com**
- Username: **anonymous**
- Password: **<your Internet e-mail address>**

You do not need a user name and password with Web browser software such as Netscape Navigator and Internet Explorer.

Support from Your Network Supplier

If you require additional assistance, contact your network supplier. Many suppliers are authorized 3Com service partners who are qualified to provide a variety of services, including network planning, installation, hardware maintenance, application training, and support services.

When you contact your network supplier for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

If you are unable to contact your network supplier, see the following section on how to contact 3Com.

Support from 3Com

If you are unable to obtain assistance from the 3Com online technical resources discussed earlier in this appendix, or from your network supplier, 3Com offers a range of support services. Purchase of a support contract gives you priority response and is typically more cost effective than purchasing service for a specific incident. To find out more about your support options, e-mail or call the 3Com technical support services at the location nearest you.

Internet Support

Some 3Com regions offer an Internet support service. To access this service for your region, use the appropriate URL or e-mail address from the list below.

Asia, Pacific Rim

From this region, e-mail:

apr_technical_support@3com.com

Europe, Middle East and Africa

From this region, enter the URL:

http://emea.3com.com/support/email.html

Latin America

Spanish speakers, enter the URL:

http://lat.3com.com/lat/support/form.html

Portuguese speakers, enter the URL:

http://lat.3com.com/br/support/form.html

English speakers, e-mail:

lat_support_anc@3com.com

Telephone Support

When you contact 3Com for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

Here is a list of worldwide technical telephone support numbers. These numbers are correct at the time of publication. Refer to the 3Com Web site for updated information

Country	Telephone Number
Asia, Pacific Rim	
Australia	1 800 678 515
Hong Kong	800 933 486
India	+61 2 9424 5179 or
	000800 650 1111
Indonesia	001 803 61009
Japan	00531 616 439 or
	03 5977 7991
Malaysia	1800 801 777
New Zealand	0800 446 398
Pakistan	+61 2 9937 5083

Country	Telephone Number
Philippines	1235 61 266 2602 or
	1800 1 888 9469
P.R. of China	10800 61 00137 or
	021 6350 1590 or
	00800 0638 3266
Singapore	800 6161 463
S. Korea	00798 611 2230 or
	02 3455 6455
Taiwan	00801 611 261
Thailand	001 800 611 2000
Europe, Middle East and Africa From anywhere in these regions, call:	+44 (0)1442 435529

Country	Telephone Number
From the following countries, you may use the toll-free numbers:	
Austria	01 7956 7124
Belgium	070 700 770
Denmark	7010 7289
Finland	01080 2783
France	0825 809 622
Germany	01805 404 747
Hungary	06800 14466
Ireland	1800 509359
Israel	1800 943 2632
Italy	199 161346
Luxembourg	800 29880
Netherlands	0900 777 7737
Norway	815 33 047
Poland	00800 441 1357
Portugal	707 200 123
South Africa	0800 991196
Spain	9 021 60455
Sweden	07711 14453
Switzerland	08488 50112
U.K.	0870 241 3901

Country	Telephone Number
Latin America	
Antigua	1 800 988 2112
Argentina	0 810 444 3COM
Aruba	1 800 998 2112
Bahamas	1 800 998 2112
Barbados	1 800 998 2112
Belize	52 5 201 0010
Bermuda	1 800 998 2112
Bonaire	1 800 998 2112
Brazil	0800 13 3COM
Cayman	1 800 998 2112
Chile	AT&T +800 998 2112
Colombia	AT&T +800 998 2112
Costa Rica	AT&T +800 998 2112
Curacao	1 800 998 2112
Ecuador	AT&T +800 998 2112
Dominican Republic	AT&T +800 998 2112

Country	Telephone Number
Guatemala	AT&T +800 998 2112
Haiti	57 1 657 0888
Honduras	AT&T +800 998 2112
Jamaica	1 800 998 2112
Martinique	571 657 0888
Mexico	01 800 849CARE
Nicaragua	AT&T +800 998 2112
Panama	AT&T +800 998 2112
Paraguay	54 11 4894 1888
Peru	AT&T +800 998 2112
Puerto Rico	1 800 998 2112
Salvador	AT&T +800 998 2112
Trinidad and Tobago	1 800 998 2112
Uruguay	AT&T +800 998 2112
Venezuela	AT&T +800 998 2112
Virgin Islands	57 1 657 0888
North America	1 800 876 3266

Returning Products for Repair

Before you send a product directly to 3Com for repair, you must first obtain an authorization number. Products sent to 3Com without authorization numbers will be returned to the sender unopened, at the sender's expense. To obtain an authorization number, call or fax using the numbers on the following pages:

Country	Telephone Number	Fax Number
Asia, Pacific Rim	+65 543 6500	+65 543 6348
Europe, South Africa, and Middle East	+44 (0)1442 435529	
From the following countries, you may use the toll-free numbers:		
Austria	01 7956 7124	
Belgium	070 700 770	
Denmark	7010 7289	
Finland	01080 2783	
France	0825 809 622	
Germany	01805 404 747	
Hungary	06800 14466	
Ireland	1800 509359	
Israel	1800 943 2632	
Italy	199 161346	
Luxembourg	800 29880	
Netherlands	0900 777 7737	
Norway	815 33 047	
Poland	00800 441 1357	
Portugal	707 200 123	
South Africa	0800 991196	
Spain	9 021 60455	
Sweden	07711 14453	
Switzerland	08488 50112	
U.K.	0870 241 3901	

Country	Telephone Number	Fax Number
Latin America		
Antigua	1 800 988 2112	
Argentina	0 810 444 3COM	
Aruba	1 800 998 2112	
Bahamas	1 800 998 2112	
Barbados	1 800 998 2112	
Belize	52 5 201 0010	
Bermuda	1 800 998 2112	
Bonaire	1 800 998 2112	
Brazil	0800 13 3COM	
Cayman	1 800 998 2112	
Chile	AT&T +800 998 2112	
Colombia	AT&T +800 998 2112	
Costa Rica	AT&T +800 998 2112	
Curacao	1 800 998 2112	
Ecuador	AT&T +800 998 2112	
Dominican Republic	AT&T +800 998 2112	

Country	Telephone Number	Fax Number
Guatemala	AT&T +800 998 2112	
Haiti	57 1 657 0888	
Honduras	AT&T +800 998 2112	
Jamaica	1 800 998 2112	
Martinique	571 657 0888	
Mexico	01 800 849CARE	
Nicaragua	AT&T +800 998 2112	
Panama	AT&T +800 998 2112	
Paraguay	54 11 4894 1888	
Peru	AT&T +800 998 2112	
Puerto Rico	1 800 998 2112	
Salvador	AT&T +800 998 2112	
Trinidad and Tobago	1 800 998 2112	
Uruguay	AT&T +800 998 2112	
Venezuela	AT&T +800 998 2112	
Virgin Islands	57 1 657 0888	
North America	1 800 876 3266 phone	
From USA and Canada, call:	1 508 323 6061 fax (not toll free)	

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